

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
29 September 2005 (29.09.2005)

PCT

(10) International Publication Number
WO 2005/089369 A3

(51) International Patent Classification⁷: **H04N 5/225**

(21) International Application Number:
PCT/US2005/008727

(22) International Filing Date: 16 March 2005 (16.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0400674-8 17 March 2004 (17.03.2004) SE

(71) Applicants and

(72) Inventors: **ADAMO, Thomas, Jeff** [US/US]; 50 West 93rd Street, New York, NY 10025 (US). **MONTELIUS, Lars** [SE/SE]; Montelinv 16, S-237 35 Bjurred (SE).

(74) Agents: **NEGRIN, Barry, E.** et al.; Levisohn, Berger & Langsam, LLP, 805 Third Avenue, 19th Floor, New York, NY 10022 (US).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,

GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

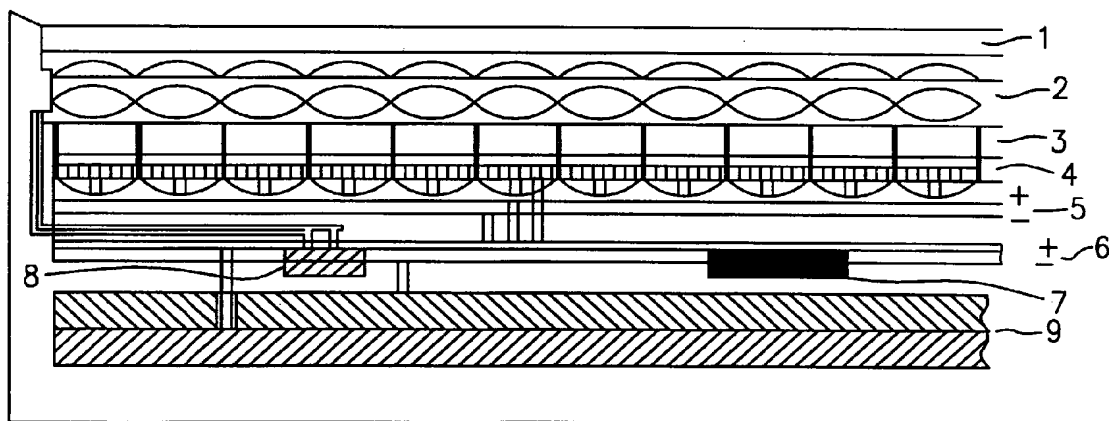
- with international search report
- with amended claims

(88) Date of publication of the international search report:
8 December 2005

Date of publication of the amended claims: 2 February 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: APPARATUS FOR IMAGING USING AN ARRAY OF LENSES



(57) Abstract: An imaging system/camera consisting of multiple nano-sized optical elements arranged in an array format with more than one pixel per optical element will have a higher resolution than each element would be capable of individually, since each element being at a different point gathers slightly different overlapping information. Hence by processing such information one can obtain a clear image. Furthermore multiple information from sectors of an array of sensors can be processed to obtain 3-D, stereotypic and panoramic imaging and may be connected to each other allowing seeing around obstacles as well as enabling full 3-D tracking and/or metric determination of an unknown object. Color/spectroscopic imaging can be achieved by utilizing equally sized lenses and multi-wavelength sensing layers below the lenses. However, color/spectroscopic imaging and/or spectroscopy can be achieved by taking advantage of unique optical properties of nano-scaled lenses accepting various wavelengths below their diffraction limits.



WO 2005/089369 A3